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AUTHOR	Goolsby, Thomas M., Jr.; Frary, Robert B.
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ABSTRACT

Two hundred first grade children participated in an experimental program involving innovative curricula and instructional techniques. A pretest-posttest method of instruction, employing sequenced and structured learning activities, enabled each child to progress at an individual rate and was supplemented by a readiness program. Evaluation of the project was undertaken to determine the effect of generous expenditures, used to modify basic conditions (class size, for example), on achievement levels. Ability and achievement tests were administered to both the experimental and comparison groups throughout the year. Analysis revealed that although the average mental age was 6 months lower for the experimental group, it essentially matched the comparison group on achievement at the end of the school year. If mental age is used as a covariate, the experimental group exceeded the comparison group on 8 of the 10 achievement variables. The effect of other variables, including readiness, sex, father's occupation, integration, grouping, Head Start, and variable interactions on achievement are also reported. The validity of the Metropolitan Readiness Test is discussed in detail and implications of the study are pointed out. Instructional materials used in the project are listed in the appendix. (PR)

ED047012

ENHANCEMENT OF EDUCATIONAL EFFECT THROUGH EXTENSIVE AND INTENSIVE INTERVENTION

THE GULFPORT PROJECT

Thomas M. Goolsby, Jr.

Robert B. Frary

JULY, 1969

GULFPORT MUNICIPAL SEPARATE SCHOOL DISTRICT

GULFPORT, MISSISSIPPI

A TITLE III ESEA PROJECT

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ENHANCEMENT OF EDUCATIONAL EFFECT THROUGH EXTENSIVE AND INTENSIVE INTERVENTION --- THE GULFPORT PROJECT

Thomas M. Goolsby, Jr.
Associate Director for Evaluation
Research and Development Center in Educational Stimulation
University of Georgia
and
Robert B. Frary, Director
Bureau of Measurement and Research
University of Miami

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Alice Smith, Project Director

Consultants

Thomas M. Goolsby, Jr.
Research and Development Center
University of Georgia

Robert B. Frary
Bureau of Measurement and Research
University of Miami

Robert L. Aaron
Research and Development Center
University of Georgia

William L. White
Department of Educational Psychology
University of Georgia

Jewel M. Frary
Pattern Analysis Laboratory
University of Miami

Teachers

Gail Alexander
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Section 1 - Introduction

The claim has often been made that lack of adequate financial and administrative support for schools results in inferior achievement of pupils. The causal basis for such outcomes is easy to hypothesize but difficult to investigate. The reason for this difficulty is that only through the expenditure of large sums of money can the basic conditions be modified within a framework compatible with a strong research design.

It was an event of great potential when the Gulfport Municipal Separate School District received a United States Office of Education Title III grant of $135,882 for the study of 200 first grade students. The Board of Trustees and administrative staff of the District determined that the main thrust of the Project should be to ameliorate possible disadvantageous conditions in their schools. At least 100 of the children were from definitely disadvantaged backgrounds as well.

In the improvement of learning conditions, two main avenues were followed. The first was the reduction of demands on the teacher. Class size was set at 20 which required the establishment of ten classes for the 200 children. Each class was provided with an aide to handle routine tasks to further free the teachers for instructional interaction with their students. The aides handled routine instructional tasks such as leading drill work and teaching enrichment units under the direction of the teacher, in addition to performing clerical tasks and managing non-instructional activities of the students. This provision also permitted the teachers time for preparation of materials and planning of instruction.

A second important approach to the problem of improving conditions was the adoption of teaching procedures and materials developed by the

University of Georgia Research and Development Center in Educational Stimulation. Throughout the entire year, the University of Georgia provided consultant services and teaching manuals. A video tape program was coordinated between the District and the Research and Development Center to implement critiques of teaching techniques and the student program. The program materials used by the teachers during the school year were graded in sequenced steps to the end that every child could attain a high level of success in the learning activities. Teaching the child that he can succeed is an important feature of the materials, designed to give him confidence and establish a good basic attitude toward school.

There are several other important aspects of this program which merit attention. First, the child is taught according to his degree of readiness for a learning activity. This is accomplished in the pretest-posttest method of instruction. The child, prior to the beginning of the lesson, is given a short test designed to determine if he has acquired the necessary skills required for mastery of the lesson content. If the teacher ascertains that he lacks these skills and understandings, the child is presented a lesson which will develop the skills needed to master the day's lesson. At the end of the lesson, a short posttest is administered to the child to ascertain if the lesson of the day has been comprehended and retained. This posttest also reinforces the learning previously established.

Second, every desirable behavior and every desirable response is immediately rewarded with a simple, "That's good, Johnny" or "Keep up the good work." This comment helps the child realize that to some extent he has achieved success in the school program.

Third, the learning activities are carefully sequenced and structured so that each lesson is written on the level of the child. Materials are written from the simple to the complex. This plan permits the child to progress at his own rate of speed.

Fourth, the traditional curriculum is supplemented. Every child in the program has the advantage of working with expanded curriculum opportunities consisting of arithmetic, reading, writing, oral language, social studies (customs and mores, anthropology, geography, and a unit on "Gulfport-Our Town"), music, physical education, and art.

Fifth, a readiness program is presented. The reading and arithmetic aspects of the University of Georgia materials are mainly devoted to readiness. The child may progress through these materials at his own rate of speed. Upon completion of these materials, the child enters the regular basal reading series and the regular arithmetic program adopted by the school system. Reports and surveys indicate that progress in both areas has been rapid once these readiness type materials have been completed and the child enters the basal series. The other areas of the curriculum extend throughout the entire school year. The social science subjects are taught on a schedule of four to six weeks per subject.

While the University of Georgia materials are the product of a very involved set of theories of learning and curriculum development, their use in the Gulfport Project was mainly for the purpose of insuring a more than adequate curriculum. Theories pertaining to the development of these materials were not tested, although the trial usage did provide valuable information for the developers. This approach freed the teachers and others involved in the Project of the need for a lock-step presentation

and encouraged creativity in adapting the materials for use with the existing instructional programming.

A listing of all instructional materials used in the Project, both University of Georgia and others, is found in Appendix I.

Research Design

Because the research undertaken bears so strongly on the need for generous expenditures for education, a strong evaluation program was implemented to determine the effects of the program. Experimental classrooms were established in all-Negro, as well as integrated schools. The 200 students assigned to these classes were chosen randomly from the in-school populations associated with each class. Teacher assignment, while not random in a formal sense, was made without any classifiable source of bias.

Prior to assignment to experimental classes, all first grade students of the District completed the Metropolitan Readiness Test (MRT), and total scores on this instrument were another basis for assignment to classes. Experimental classes were established with both homogeneous and heterogeneous grouping. Further, the homogeneous groups consisted in some cases of higher readiness students and in some cases those of lower readiness.

From the remaining twenty-four first grades of the District, ten comparison classes were selected. It was possible to select or establish groups sharing many of the characteristics of the experimental ones. For example, all-Negro and integrated, as well as homogeneously and heterogeneously grouped classes were included in the comparison set. However, administrative considerations precluded matching each group with respect to every relevant variable. For example, there were no integrated,

homogeneously grouped classes in the comparison set, while there were three such classes in the experimental set. This design deficiency places limitations on the interpretation of certain outcomes of the study, but by no means invalidates the conclusions generally. In every case, possible design influences on otherwise clear cut outcomes will be discussed following presentation of results. There was no evidence of any source of bias in selection of classes, teachers, or students in the comparison groups. While they cannot be said to have been randomly assigned, no effect on outcomes seems likely as a result of selection bias. Table 1 lists classes of the study and presents basic descriptive statistics concerning the students as they appeared at the beginning of school in September.

The comparison classes received no special treatment throughout the school year. A sequence of standardized achievement tests was given to both the experimental and comparison classes to monitor progress at various points. In addition, personal data and intelligence test scores were obtained for each student. The sequence of achievement scores for each student constituted his "achievement vector."

From the data available, statistical analyses, mainly multivariate analysis of covariance, then sought answers to various questions, a few of which are:

Is the experimental or comparison treatment superior?

Is either treatment superior for some particular subset of the student population?

What effect does readiness have with respect to the two treatments?

Is either homogeneous or heterogeneous grouping superior?

Do Head Start Program participants have better achievement than non-Head Start students with similar mental age and socioeconomic status?

Do Negro students in integrated classrooms have better achievement than those in all-Negro classes when mental age is held constant?

Formal statistical hypotheses corresponding to these questions are not stated. Because of certain departures from the formal requirements for application of multivariate analysis of covariance, it was judged preferable to present the results and let the reader draw many of his own conclusions. Nevertheless, these deficiencies are comparatively minor. For example, there is a slight tendency for the treatment to correlate with the covariate, mental age, due to the design requirement that half the experimental population comes from deprived areas. This population is greater than the proportion of deprived in the comparison group. Also, there was no random assignment between treatments, although there was essentially random selection for each group. In spite of these shortcomings, the analyses presented are judged to be the most informative possible in view of the complexity of the data.

A representative subset of the experimental and comparison groups was retested late in the school year with the MRT. This was done to complete a readiness study based on intercorrelations between readiness scores and achievement scores from both before and after the first year period of instruction. Factor analysis was the statistical technique involved in this investigation, the purpose of which was to investigate the validity of the MRT both with respect to total scores and part scores.

This phase of the study was also planned to permit identification of those behaviors with which later achievement can be most reliably associated. In this connection, the protocol, Evaluation of Cognitive Development--An Observational Technique--Pre-Reading Skills (Goolsby, 1969), was completed for a representative subset of students by their teachers late in the year. This special inventory asks the teacher to state the presence of certain behaviors relevant to reading readiness. The responses to these questions could be related to other readiness and achievement measures taken over the preceding months.

Relation to Other Studies

There are studies too numerous to cite relating to the achievement levels attained by students in poorly financed school systems as compared to those more adequately financed. In general, the conclusion seems to be that the better conditions generally associated with better financing result in higher achievement. This conclusion, plausible as it may seem, is not conclusive since no study comparing achievement in two settings can possibly account for all the differences in variables, other than those involving finances, which may affect achievement. Even if intelligence, income level of the parents and other accessible variables are held constant, the multitude of nonaccessible variables may tip the scales in one direction or another. Factors such as community attitude toward schools, dietary differences, teacher training differences, etc., may have a strong cumulative effect.

The present study is unique in that a massive change in educational conditions was effected within a single community utilizing a research design which permits a statistically powerful evaluation of observed differences in achievement. While generalization from the findings may

not be possible in all cases, a wide scope of generalization seems feasible. Specifically, the findings should be applicable wherever an urban school system faces the problem of lower achievement for segments of the system which have been subjected to inferior learning conditions. Further, conclusions regarding a minority Negro population under segregated and integrated conditions should be widely applicable.

In addition to the broader questions just raised, the present study brought forth a number of subsidiary results of theoretical and practical importance, many of which are related to other studies reported in the literature. Rather than review these studies at this time, they will be discussed at each point in the report at which a relevant result is presented.

Effect on the School System and the Community

One of the most successful aspects of the Gulfport Project was that of teacher attitude and enthusiasm. Teachers approached new teaching media and new methods of instruction with creativity and a high degree of enthusiasm.

From the community point of view, the program was an avenue for bringing the accomplishments of the community to the classroom. Prior to a unit on "Gulfport-Our Town," letters were forwarded to industries in Gulfport requesting samples of their products and any available brochures which would supply information about the procedures involved in producing their products. The purpose of the program was described briefly in the letter. Response was overwhelming. Each classroom was supplied with an ample number of samples, pictures, and brochures from each industry contacted.

Parents generally displayed interest and enthusiasm in the program. They expressed approval of the supplemental curriculum and the innovative teaching media and methods used in the implementation of the instructional program.

Early in the program, it was anticipated that the result of selective and continuous stimulation for the 200 children in the experimental group would result in higher levels of achievement that would otherwise be attained.

Section 2 - Major Results

Measurement Procedures

Every effort was made to obtain scores for every experimental and comparison subject for all of the variables reported. If it was not possible to obtain a score for a student, it made it necessary to discard that student's scores in some of the analyses which follow. Thus, while there were 198 students in the experimental classes and 290 in the comparison classes, many analyses account for fewer than the total number of 488 students.

Personal Data

For each student in the experimental and comparison groups personal data representing the following variables were collected:

Number of Siblings

Days Absent

Ethnic Group (Negro or White)

Head Start Participation (if any)

It should be noted that "number of siblings" does not refer to the number of children in the family but to the number of brothers and sisters.

One additional personal datum for each subject reflected socioeconomic status of the child's family. To obtain this information, each teacher classified each of her students according to his father's occupation on a three point scale. Category 1 included those whose occupation might generally be classified as "professional." For the most part these occupations were ones which required at least a bachelor's degree for admission. Category 2, which may be referred to as "skilled," included occupations requiring

substantial training and ability for success but not at the level of the first category. Category 3 included those jobs which required little preparation or training, which were relatively low-paying and offered little security. The protocol on which teachers based their classifications is shown in Appendix II.

This classification scheme does not offer the degree of differentiation available from scales demanding higher levels of training for the raters, such as the Hollingshead (1958) or Warner (1949) scales. Nevertheless, it was adopted because it was believed that the teachers involved, knowing the community as they did, could place their students quite accurately as coming from homes representing one of the three categories just described. It was felt that the additional effort required to obtain a more precise classification might not result in a substantially more accurate classification in view of the purpose for which the classification system was introduced. That purpose was to classify students at three levels to define a main effect for analysis of variance.

The Otis-Lennon Mental Ability Test (Otis-Lennon, 1967), Primary II Level, Form J, was administered in December to all experimental and comparison classes. Mental age scores were primarily used in the analyses to follow and were slightly more highly correlated with achievement scores which made them more useful as a covariate. This usage follows that of other researchers who have used mental ability measurements as covariates (Fry, 1966).

Readiness Data

The MRT, Form A (revised 1964), had been administered to all experimental and comparison groups early in September of the school year.

Placement in various groups according to level of readiness was made on the basis of total scores, but scores on each of the six parts of the MRT were recorded separately to be used in other analyses.

In late May, at the end of the school year, Form B of the MRT (revised 1964) was administered to subgroups of the experimental and comparison classes. Specifically, it was administered in classes 2, 3, and 7 of the experimental groups and classes 1, 3, and 8 of the comparison groups (see Table 1). It was judged that these six classes represented a fair cross-section of the total population.

Evaluation of Cognitive Development--Pre-Reading Skills (Goolsby, 1969) was completed for another representative subset by their teachers in May. On this instrument, teachers state the presence of various student behaviors relevant to reading readiness. It was realized that many of the behaviors listed would be demonstrated by virtually all of the students in the study at this late point in the school year. However, this new instrument was not available at the time for which it was designed to be used, and it was believed that the results of its administration might yield valuable insights with respect to behaviors not achieved by substantial numbers of first graders. This measurement was taken in experimental classes 1, 6, and 9 and comparison classes 1, 2, and 10.

Achievement Data

The Metropolitan Achievement Tests (MAT), Primary I Battery, Form A, was administered to all experimental and comparison classes in February. The battery includes the subtests: Word Knowledge, Word Discrimination, Reading, and Arithmetic. In late May the same battery, Form B, was readministered to all classes in the study. This testing permitted

Table - Characteristics of Classes in Study

Experimental Classes	Number Students	MRT Total Raw Mean	S.D.	Percent Negro
1	20	20	8.2	25
2	20	22	7.8	100
3	20	31	5.6	100
4	19	32	19	38
5	20	42	13	100
6	20	46	19	35
7	19	48	18	5
8	20	53	16	10
9	20	63	11	20
10	20	64	13	20
Comparison Classes				
1	28	22	18	100
2	31	40	10	0
3	33	41	12	0
4	29	45	19	11
5	30	51	17	0
6	31	52	16	11
7	21	55	16	0
8	31	59	17	0
9	23	60	9	0
10	33	63	11	0

comparison of achievement results not only by the groups but over time as well.

In April, the Botel Reading Inventory (BRI) was administered in all classes. The BRI provides two scores which were utilized in the study. These are Instructional Level and Potential Level. Each of the scores represents the level up to which the student has essentially mastered certain reading skills. The Instructional Level attained represents mastery in Word Recognition and Word Opposites (as read by the student). The Achievement Level represents mastery of Word Opposites as presented orally by the teacher and may be considered to some extent to be a measure of extensiveness of vocabulary.

One other achievement measure was the teachers' estimate of each child's grade level reading achievement in February. For example, a teacher evaluation of 1.6 at this point in the school year represents achievement at grade level for the child evaluated. Teachers were asked to place this evaluation not according to levels attained by other students in their class but according to how they perceived achievement with respect to all first grades.

Major Results of the Study

To analyze the achievement data, a multivariate analysis of covariance was performed. Mental age was the covariate and ten achievement scores for each student represented the criterion vector. The design was a complete factorial with four factors as follows:

1. Experimental Condition: Two levels, experimental and comparison.

2. Readiness: Three levels, according to total scores on the MRT.

Below 40, Low Readiness

41 to 65, Medium Readiness

Above 65, High Readiness

3. Father's Occupation: Three levels, professional, skilled, unskilled.

4. Sex: Two levels, male and female.

The program used for analysis was the multivariate analysis of covariance program from Multivariate Statistical Programs by Clyde, Cramer and Sherin (1966). This program is very flexible in that unequal numbers of cases per cell are handled with appropriate adjustments for significance levels according to the method presented by Bock (1963). Another feature of the program is a check for the significance of the F ratio associated with the sum of squares for regression of the covariate(s) on the criteria. Of course, nonsignificance of this ratio would indicate that the proposed covariate might not be appropriate for the analysis of variance model. For all covariates in analyses reported herein, this ratio was significant at the .001 level of probability.

Table 2 presents the F test results from this analysis. These tests are based on Rao's approximation of Wilks' lambda criterion. Thus, the degrees of freedom listed are not easily identifiable as resulting from the various numbers of cells and subjects.

One particularly valuable aspect of the program used is its provision of a feature to indicate which cell means are higher after adjustment for the covariate(s). Thus, it is possible to determine for main effect which group is favored on each criterion variable after the

Table 2 - Multivariate Analysis of Covariance Using Wilks' Lambda Criterion and Rao's Approximation

Factor			df	F	p less than
Main Effects:	Experimental Condition	(EC)	(10,391)	6.44	.001
	Father's Occupation	(FO)	(20,782)	2.80	.001
	Sex	(S)	(10,391)	2.48	.007
	Readiness	(R)	(20,782)	5.71	.001
First Order Interactions[1]:	EC x FO		(20,782)	1.605	.045
	EC x S		(10,391)	.951	.486
	EC x R		(20,782)	2.00	.006
	R x FO		(40,1485)	1.13	.266
	R x S		(20,782)	.614	.905
	FO x S		(20,782)	1.45	.091

[1]No higher order interactions significant

covariate adjustment. In addition, the program provides univariate tests of significance for each variable in the criterion vector for each of the main effects and interactions. These two provisions taken together permit determining which variables have the most pronounced influence on multivariate significance levels and the direction of the effect.

Effect of Experimental Conditions

As seen from Table 2, the main effect, experimental condition, accounted for differences in cell means at the .001 level of probability. An interpretation of this result may be made from inspection of Table 3.

It can be observed in Table 3 that for the covariate, mental age, the experimental group is substantially weaker than the comparison group. In fact, there is a mean difference in mental age of over six months between these two groups. Since mental age is known to be related to achievement in school, it would be only natural to expect the comparison group to, in general, have higher achievement. Observation of the achievement means for the two groups shows that this result did not occur. While the comparison means are, for the most part, higher than those for the experimental group, the differences are very slight. In fact, the computer output shows that, after adjustment for the covariate, the experimental group actually exceeded the comparison group on eight of the ten achievement variables. An inspection of the univariate tests shows that seven of the ten achievement variables were probably prime contributors to the significant multivariate result. The first MAT Reading Subtest was the only one of the seven in favor of the comparison group after adjustment for the covariate. It is concluded quite confidently that the experimental treatment was superior. While this conclusion

of itself is not particularly surprising in view of the superior conditions of instruction for this group, the magnitude of the difference is well worth noting. Even though the experimental group had a mean mental age almost six months lower than that for the comparison group, by the end of the year their achievement on standardized tests was very nearly equal to that for the comparison group. In evaluating this result, it must be remembered that six months mental age difference is a very substantial amount for children this young.

Two other observations may be made in connection with Table 3. One of these has already been alluded to, the fact that deficits for the experimental group with its lower mental age decreased as the year progressed. In fact, the instructional level on the BRI for the experimental group actually exceeded the comparison group without consideration of covariate effect. The other observation concerns two of the achievement variables for which univariate F tests were not significant, namely, Teacher Evaluation and the first MAT Reading Subtest. The fact that these two variables did not follow the established significance pattern in this analysis, and again do not in subsequent analyses to be reviewed, suggest some lack of validity for these scores for comparison of the two groups. Specifically, it is suggested that Teacher Evaluation may have been biased in favor of the class mean observed by each teacher in her own class. In other words, teachers may have evaluated their students according to the average achievement within the class rather than with respect to some outside standard. The variable associated with the first MAT Reading Subtest may perform as it does due to differences in pace of instruction from the experimental to the comparison groups.

Table 3 - Effect of Experimental Treatment on Achievement

Variable		Experimental N=181 Raw Mean	S.D.	Comparison N=264 Raw Mean	S.D.	Univariate F Tests F(1,400)	p less than
Mental Age, months (covariate)		73.2	13.4	79.5	11.8	-	-
Metropolitan Achievement First Administration:	Word Knowledge*	14.3	6.95	16.4	7.70	3.39	.066
	Word Discrimination**	14.5	6.77	17.2	7.39	7.83	.005
	Reading**	14.3	6.33	17.2	7.58	6.57	.011
	Arithmetic*	33.3	16.0	38.5	15.0	1.35	.246
Metropolitan Achievement Second Administration:	Word Knowledge*	23.1	8.04	23.4	7.93	2.76	.097
	Word Discrimination*	23.0	8.28	24.1	8.18	.131	.718
	Reading*	24.4	10.5	24.8	10.8	4.36	.038
	Arithmetic*	46.5	13.9	47.7	12.5	4.21	.041
Botel Instructional Level[1]*		2.02	1.06	1.87	1.05	13.0	.001
Teacher Evaluation, grade placement*		1.51	.293	1.58	.27	.865	.353

[1]Coded as follows: 1=preprimary; 2=primary; 3=1st grade;
4=2nd grade, 1st semester; 5=2nd grade, 2nd semester; etc.

*Magnitude of adjusted means is greater for experimental group than comparison group.
**Magnitude of adjusted means is greater for comparison group than experimental group.

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Table 4 presents descriptive statistics for other variables in the study according to experimental and comparison groups. In general, these data further support the judgment that the experimental group was considerably less well prepared for school than the comparison group. They came from homes where the father's occupation was of lower status. They came from homes with larger families. Perhaps more importantly they came to school with much weaker vocabularies as evidenced by the mean scores for the Botel Potential Level. It is interesting to note, however, that there was no substantial difference in number of days absent for the two groups.

It should be pointed out at this time that the above conclusions regarding the superiority of the experimental treatment are important mainly in the light of the magnitude of the changes effected. Literature is replete with studies which show that small class size is a factor in improving instruction. Clearly, however, class size alone can never be expected to account for large changes in educational outcome. Haberman and Larson (1968) report that in the absence of other directions teachers given smaller than usual classes tend to present the same material in the same manner to their students as teachers who have larger classes. In the words of these investigators:

> "Would cutting class size change instruction? We doubt it. Teachers just don't differentiate refinements or instructional activities; their role perceptions are probably not a function of class size at all. If smaller classes are to make a difference in the classroom behavior of teachers, it may be that they need to be instructed on how to teach a small class in different ways."

Table 4 - Other Variables by Experimental Condition

Variable	Experimental N=181 Raw Mean	S.D.	Comparison N=264 Raw Mean	S.D.
Father's Occupation[1]	2.39	.679	1.94	.611
Number of siblings	4.60	2.62	3.39	1.99
Metropolitan Readiness Test - Total Score	42.4	20.2	51.0	18.5
Botel Potential Level[2]	2.83	1.88	4.24	2.58
Days Absent	10.0	10.8	10.9	10.9

[1]Coded as follows: 1 = professional; 2 = skilled; 3 = unskilled
[2]Coded as follows: 1 = preprimary; 2 = primary; 3 = 1st grade;
4 = 2nd grade, 1st semester; 5 = 2nd grade, 2nd semester; etc.

The Gulfport Project was designed not simply to show the effect of class size but to provide the teachers with a variety of material and activities to permit them to take advantage of reduced class size.

Again, of course, the literature is full of studies which show the superiority of one teaching method or one set of materials over another, but experience has shown that these results can seldom be replicated. With its combination of activities, smaller class size and special materials, the Gulfport Project offers a model for producing substantial results in the improvement of instruction, without the problem of nonreplicability caused by failure to account for major variables within the system. For example, how can class size be depended upon to improve instruction if there is no uniform provision of supplementary activities and material to permit the teacher to capitalize from the condition? Similiarly, how can a new method or set of material be depended upon to influence instruction when teachers are forced to use the material under a variety of sometimes unsatisfactory conditions? The Gulfport Project avoids the pitfalls posed by these two questions.

Effect of Readiness

As seen in Table 5, readiness had a strong and highly significant effect on achievement. This result is particularly significant in view of the fact that a covariate, mental age, was taken into consideration. In spite of the fact that there were substantial differences in mean mental age, from one readiness group to another, readiness level still had a strong effect on outcomes. Further, the computer output shows the high readiness favored in every case. While this result is subsidiary to the main thrust of the Project, it does point out to teachers

Table 5 - Effect of Readiness on Achievement

Variable		Low Readiness MRT Total less than 41 Raw Mean*	S.D.	Medium Readiness MRT Total 41-65 Raw Mean*	S.D.	High Readiness MRT Total above 65 Raw Mean*	S.D.	Univariate F Tests F(2,400)	p less than
Mental Age, months (covariate)		66.8	10.6	79.0	8.92	86.8	9.43	-	-
Metropolitan Achievement First Administration:	Word Knowledge	10.9	5.94	16.0	7.94	20.9	6.36	20.0	.001
	Word Discrimination	11.2	4.94	16.1	6.33	21.8	6.11	31.8	.001
	Reading	12.8	6.04	16.8	6.96	19.3	7.86	3.88	.021
	Arithmetic	23.9	13.6	39.2	11.8	48.8	9.69	30.9	.001
Metropolitan Achievement Second Administration:	Word Knowledge	17.6	7.31	24.2	6.81	29.2	4.55	29.9	.001
	Word Discrimination	17.7	7.42	24.8	7.33	29.6	4.79	26.3	.001
	Reading	17.4	7.49	25.1	9.67	32.8	8.75	31.6	.001
	Arithmetic	38.7	15.3	48.8	10.2	55.3	5.45	9.89	.001
Botel Instructional Level[1]		1.31	.581	1.93	.947	2.67	1.11	29.3	.001
Teacher Evaluation, grade placement		1.38	.216	1.59	.491	1.77	.286	7.25	.001

[1]Coded as follows: 1=preprimary; 2=primary; 3=1st grade;
4=2nd grade, 1st semester; 5=2nd grade, 2nd semester; etc.

*The value of adjusted means are ranked in magnitude from high, medium to low readiness, respectively.

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and administrators the very great importance which must be attributed to the construct, readiness.

Table 6 shows descriptive statistics for other variables by level of readiness. As would be expected, the lower readiness students invariably have poorer scores on all the variables shown in this table. It is particularly interesting to note the variable, days absent. The low readiness students missed on the average 3.6 days more school in the course of the year than the high readiness students. This result is in contrast to the lack of difference in mean number of days absent for the experimental and comparison students as shown in Table 4, considering the fact that the experimental students had a six month lower mean mental age.

Effect of Father's Occupation

Table 7 shows that father's occupation does indeed have a global effect on achievement. However, this table is more difficult to interpret by inspection than those presented earlier. The covariate, mental age, was much lower for the unskilled group than for either of the other two, and, not surprisingly, mean achievement scores for this group were much lower. The skilled group has a mean covariate score not a great deal lower than the professional group. The program printout shows that on most variables the skilled group were best performers, taking the covariate into consideration. In fact, this group achieved its expected ranking or higher on every single one of the variables. The professional group ranked lowest on six of the ten achievement variables, taking the covariate into consideration.

One plausible interpretation of this result is that the children from homes of less than professional status but in which the parents

Table 6 - Other Variables by Levels of Readiness

Variable	Low Readiness N=166 MRT Total less than 41 Raw Mean	S.D.	Medium Readiness N=143 MRT Total 41-65 Raw Mean	S.D.	High Readiness N=139 MRT Total above 65 Raw Mean	S.D.
Father's occupation[1]	2.46	.609	2.01	.628	1.82	.648
Number of siblings	4.82	2.83	3.98	3.61	2.88	1.46
Metropolitan Readiness Test - Total Score	26.5	9.38	54.1	13.2	70.1	7.33
Botel Potential Level[2]	1.93	1.43	3.95	2.19	5.44	2.15
Days absent	12.3	13.3	10.9	11.9	8.68	8.03

[1]Coded as follows: 1=professional; 2=skilled; 3=unskilled

[2]Coded as follows: 1=preprimary; 2=primary; 3=1st grade; 4=2nd grade, 1st semester; 5=2nd grade, 2nd semester; etc.

Table 7 - Effect of Father's Occupation on Achievement

Variable		Professional N=77 Raw Mean	S.D.	Skilled N=235 Raw Mean	S.D.	Unskilled N=131 Raw Mean	S.D.	Univariate F Tests F(2,400)	p less than
Mental Age, months (covariate)		85.0	9.23	80.0	11.1	66.8	11.3	-	-
Metropolitan Achievement First Administration	Word Knowledge	19.6(1)*	7.05	16.1(2)*	7.22	12.1(3)*	6.63	8.35	.001
	Word Discrimination	19.6(1)	7.38	16.9(2)	6.93	12.6(3)	6.36	6.62	.001
	Reading	17.1(3)	6.45	16.7(2)	7.02	14.3(1)	7.76	.485	.616
	Arithmetic	42.2(3)	11.5	40.3(1)	13.7	25.9(2)	15.9	11.8	.001
Metropolitan Achievement Second Administration	Word Knowledge	26.8(3)	6.34	24.3(1)	7.66	19.4(2)	7.89	6.82	.001
	Word Discrimination	28.0(1)	6.13	24.7(2)	7.76	19.3(3)	8.14	10.6	.001
	Reading	27.8 (3)	10.7	25.9(2)	10.5	20.6(1)	9.90	1.99	.139
	Arithmetic	51.1(2)	10.7	49.6(1)	11.1	40.7(3)	15.1	2.71	.008
Botel Instructional Level[1]		2.17(3)	1.25	2.02(2)	1.03	1.63(1)	.914	1.77	.172
Teacher Evaluation, grade placement		1.68(3)	.296	1.58(2)	.256	1.44(1)	.280	.939	.373

[1]Coded as follows: 1=preprimary; 2=primary; 3=1st grade;
4=2nd grade, 1st semester; 5=2nd grade, 2nd semester; etc.

*Number in parentheses indicates the order of magnitude of adjusted means for each variable

have achieved a secure occupational status, have higher motivation than that of children from professional homes. Regardless of the correctness of this interpretation, the significance of the results shown in Table 7 strongly imply that the schools could obtain better results on the average for children from professional homes and quite possibly from unskilled homes as well. Another interpretation of this result involves a significant interaction between father's occupation and experimental condition. This effect will be discussed following presentation of results regarding main effects.

Table 8 shows descriptive statistics for other variables in the study according to father's occupation. Perhaps the most notable statistic in this table is number of days absent for children whose fathers are unskilled. The causes for this difference could easily be investigated and might provide valuable clues as to appropriate treatment to improve instructional outcomes for these children.

Effect of Sex

It comes as no surprise that the results of Table 9 show that girls do better than boys in the first grade. The covariate for this analysis has an almost identical mean for the two groups and girls' scores are consistently higher than those of the boys. The factor of sex was included in this analysis for two reasons. One, it reduced error variance adding power to the statistical tests for other factors and second, there was a possibility of interaction with treatment effect. Undoubtedly, error variance was reduced but no F test for an interaction with sex had an associated probability value of less than .05. This latter result is not surprising in view of the difficulty

Table 8 - Other Variables by Father's Occupation

Variable	Occupational Level: Professional N=77 Raw Mean	S.D.	Skilled N=235 Raw Mean	S.D.	Unskilled N=131 Raw Mean	S.D.
Number of siblings	3.35	1.87	3.34	1.80	5.17	2.90
Metropolitan Readiness Test - Total Score	58.8	14.6	51.1	17.8	34.7	18.8
Botel Potential Level[1]	5.41	2.25	3.94	2.33	2.15	1.72
Days absent	9.96	7.48	9.07	8.69	13.6	14.8

[1]Coded as follows: 1=preprimary; 2=primary; 3=1st grade; 4=2nd grade, 1st semester; 5=2nd grade, 2nd semester; etc.

Table 9 - Effect of Sex on Achievement

Variable		Boys Raw Mean	N=221 S.D.	Girls Raw Mean*	N=212 S.D.	Univariate F. Tests F(1,400)	p less than
Mental Age, months (covariate)		76.9	13.0	77.0	12.7	-	-
Metropolitan Achievement First Administration:	Word Knowledge	15.3	7.74	15.8	7.16	.525	.409
	Word Discrimination	15.6	7.51	16.7	6.95	4.23	.040
	Reading	15.3	7.31	16.8	7.08	5.24	.023
	Arithmetic	35.4	16.2	37.4	14.8	3.12	.078
Metropolitan Achievement Second Administration:	Word Knowledge	22.3	8.30	24.3	7.47	11.5	.001
	Word Discrimination	23.0	8.61	24.4	7.73	5.41	.021
	Reading	23.2	10.5	26.2	10.7	16.4	.001
	Arithmetic	46.4	14.1	48.1	12.0	4.62	.032
Botel Instructional Level[1]		1.82	1.06	2.04	1.03	8.75	.003
Teacher Evaluation, grade placement		1.52	2.89	1.59	.272	2.30	.130

[1]Coded as follows: 1=preprimary; 2=primary; 3=1st grade;
4=2nd grade, 1st semester; 5=2nd grade, 2nd semester; etc.

*The magnitude of adjusted means for each variable was greater for girls except for Word Knowledge of MAT first administration.

many researchers have faced in trying to find some basis for differential treatment according to sex in elementary school instruction (Wyatt, 1966).

Table 10 presents descriptive statistics for other variables in the study according to sex. As would be expected, girls have slightly higher readiness scores on the average. It is interesting to note that the boys may have slightly higher vocabulary levels as evidenced by the Botel Potential Level and that the girls, in spite of their superior achievement, appear to have more absences.

Interaction Between Experimental Conditions and Readiness

As seen in Table 2, the F ratio associated with the interaction between readiness and experimental condition can hardly be attributed to chance ($p=.006$). An inspection of the data in Table 11 readily accounts for this result. Note that the mean covariate scores (mental age) are nearly the same for the experimental and comparison groups under high readiness. Then, in the high readiness column, it is observed that differences between the experimental and comparison high readiness groups are negligible in most cases, especially for variables reflecting end-of-year achievement. Such is not the case for the low or medium readiness groups. In these two cases, the covariate favors the comparison group. Thus, substantially lower scores should be expected on most variables for the experimental group as compared to the comparison group. An inspection of the low and medium readiness columns shows some striking departures from this expected result. In fact, in many cases, the experimental group exceeds the comparison group. The significance of the interaction may

Table 10 - Other Variables by Sex

Variable	Boys Raw Mean	N=221 S. D.	Girls Raw Mean	N=233 S.D.
Father's occupation[1]	2.08	.659	2.17	.690
Number of siblings	3.93	2.57	3.82	2.05
Metropolitan Readiness Test - Total Score	46.8	20.8	48.3	18.3
Botel Potential Level[2]	3.73	2.59	3.59	2.22
Days absent	9.78	9.41	11.4	12.2

[1]Coded as follows: 1=professional; 2=skilled; 3=unskilled

[2]Coded as follows: 1=preprimary; 2=primary; 3=1st grade; 4=2nd grade, 1st semester; 5=2nd grade, 2nd semester; etc.

Table 11 - Interaction Between Experimental Condition and Readiness

Variable			Low Readiness MRT Total less than 41 N	Raw Mean	S.D.	Medium Readiness MRT Total 41-65 N	Raw Mean	S.D.	High Readiness MRT Total above 65 N	Raw Mean	S.D.	Univariate F Tests F(2,400)	p less than
Mental Age, months (covariate)		(E)[1]	91	65.8	11.1	44	76.4	7.81	43	86.7	10.2	-	-
		(C)[2]	71	68.8	10.5	96	80.4	8.91	92	87.0	9.10		
Metropolitan Achievement First Administration:	Word Knowledge	(E)		11.3	6.32		15.8	4.84		19.4	6.75	1.12	.326
		(C)		10.5	5.5		16.2	9.04		21.4	6.06		
	Word Discrimination	(E)		10.9	4.94		16.2	5.70		20.4	6.36	1.60	.203
		(C)		11.7	4.96		16.2	6.59		22.3	5.86		
	Reading	(E)		11.5	5.10		15.2	4.52		19.4	6.98	.988	.373
		(C)		14.5	6.75		17.6	7.72		18.6	7.76		
	Arithmetic	(E)		23.3	12.9		39.6	9.07		48.7	11.3	.958	.385
		(C)		24.7	14.3		39.3	12.7		48.6	8.96		
Metropolitan Achievement Second Administration:	Word Knowledge	(E)		18.3	7.48		27.2	4.43		29.2	5.24	6.00	.003
		(C)		17.1	7.08		23.1	7.16		29.3	3.91		
	Word Discrimination	(E)		18.2	7.73		26.5	5.53		29.5	5.13	1.97	.141
		(C)		17.0	7.14		24.3	7.87		29.8	4.45		
	Reading	(E)		17.7	7.66		29.4	8.21		33.8	7.76	6.70	.001
		(C)		17.4	7.33		23.4	9.77		32.2	9.24		
	Arithmetic	(E)		40.0	15.0		51.7	7.93		55.5	7.30	2.48	.085
		(C)		37.9	15.4		47.8	10.9		55.2	4.31		
Botel Instructional Level[3]		(E)		1.39	.628		2.41	.897		3.00	1.05	4.57	.011
		(C)		1.24	.520		1.73	.900		2.51	1.10		
Teacher Evaluation, grade placement		(E)		1.37	.235		1.56	.166		1.77	.306	.001	.999
		(C)		1.40	.190		1.61	.586		1.76	.264		

[1] E=Experimental

[2] C=Comparison

[3] Coded as follows: 1=preprimary; 2=primary; 3=1st grade; 4=2nd grade, 1st semester; 5=2nd grade, 2nd semester; etc.

be explained in this manner: Low and medium readiness groups profitted extremely from the experimental treatment while high readiness students achieved approximately the same under either treatment. This result is extremely important in that it pinpoints the effectiveness of the experimental program. Moreoever, it is a plausible result in that it has long been claimed that lack of attention has a much worse effect on less well prepared students than on those who can "cope for themselves."

Interaction Between Experimental Conditions and Father's Occupation

Table 2 shows that the observed interaction between father's occupation and experimental conditions would occur by chance only 4.5% of the time. An inspection of the cell means shows that such an interaction is largely the result of the failure of children with fathers in the highest occupational category to achieve higher scores than those whose fathers are in the second occupational category in comparison classes. In experimental classes, children whose fathers were in the highest occupational category did achieve higher scores than those whose fathers were in the second occupational category. This condition was not prevalent with respect to all the achievement variables in the study. Only in the case of the first MAT Reading Subtest does the univariate F test have an associated probability value of less than .05. As pointed out earlier, the validity of this variable is somewhat suspect. It may well be that if the criterion vectors had not contained this score, the above reported interaction would not have been significant at less than the .05 level of probability.

There was a tendency of other variables to reflect the pattern of lower than expected achievement level for comparison students whose

fathers were in the highest occupational category. Considering that these children's mental ages were somewhat higher than those for other occupational groups, an interpretation of the possible interaction might be that in the larger classes of the comparison group these children did not receive the individual attention necessary to permit them to achieve at the level of their potential.

While the above interpretation may be correct, it must be accepted only tentatively as a conclusion. This statement reflects both the uestionable nature of the first NAT Reading scores and the relatively high probability of .045 associated with this interaction. If this interpretation is correct, it would also help to account for the apparent superior achievement of children whose fathers' occupations were in Category 2, as noted in the discussion of the main effect, father's occupation, presented earlier.

Effects of Integration on Negro Students

A separate multivariate analysis of covariance was performed on Negro students only when using the same criteria as in the preceding analysis. In the new analysis there were three crossed factors as follows:

Integration: Two levels, integrated or all Negro. according to the type of class each student was assigned.

Experimental Condition: Two levels, experimental and comparison.

Readiness: Two levels, according to total score on the MRT.

Below 40 - Lower Readiness

40 and above - Higher Readiness

The multivariate F tests associated with each of the main effects was significant with a probability of less than .005. This outcome is not surprising in the case of the experimental condition factor or the readiness factor, since there was no reason to expect differences according to race with respect to these factors. The significance of the integration factor, however, is clearly of interest and Table 12 shows statistics which bear on this result.

Two covariates were used in this analysis because it was felt that Negro children might be more likely to be enrolled in an integrated school if their fathers' occupations were higher in socioeconomic status. This tendency appears to be slight, even if present at all. Note that mean father's occupation for the segregated group is only of slightly lower status than that for the integrated group. Mean mental age for the segregated group is somewhat lower than that for the integrated group. In spite of the covariates, the integrated group achieved at a much higher level than the segregated group as shown by the program printout listing the favored cell means after adjustment for the covariate. In other words, even equalizing for mental age and father's occupation, the integrated group achieved significantly higher on a substantial number of criteria. This result suggests that there is great advantage for Negro children when they are educated in a predominately white classroom.

First order interactions of the integration factor with the experimental conditions factor and the readiness factor were also of interest. Of these two interactions only the one between experimental condition and integration had an associated F test significant at a probability level of less than 5%. The cell means associated with this interaction showed that it was caused primarily by exceptionally good performance

Table 12 - Effect of Integration on Achievement of Negro Students

Variable		Segregated N=74 Raw Mean	S.D.	Integrated N=33 Raw Mean*	S.D.	Univariate F Tests F(1,97)	p less than
Mental Age, months (covariate)		61.4	7.27	72.2	8.96	-	-
Father's occupation[1] (covariate)		2.77	.548	2.58	.314	-	-
Metropolitan Achievement First Administration:	Word Knowledge	11.6	6.41	13.6	4.82	.542	.463
	Word Discrimination	11.0	5.93	15.4	4.71	.170	.681
	Reading	11.2	6.03	15.6	5.34	2.41	.124
	Arithmetic	18.8	11.8	34.9	9.04	8.28	.005
Metropolitan Achievement Second Administration:	Word Knowledge	17.0	6.46	24.9	6.05	4.07	.046
	Word Discrimination	16.4	6.87	24.4	5.83	2.80	.097
	Reading	17.4	5.81	24.8	8.12	2.76	.100
	Arithmetic	32.6	12.6	50.4	7.15	11.9	.001
Botel Instructional Level[2]		1.49	.732	2.91	1.71	10.4	.002
Teacher Evaluation, grade placement		1.36	.151	1.52	.171	.391	.533

[1]Coded as follows: 1=professional; 2=skilled; 3=unskilled

[2]Coded as follows: 1=preprimary; 2=primary; 3=1st grade; 4=2nd grade, 1st semester; 5=2nd grade, 2nd semester; etc.

*The magnitude of adjusted means for each variable was greater for the integrated condition except for Teacher Evaluation.

of integrated subjects in the comparison group. Since only four cases were in this category, the authors hesitate to offer an interpretation for this outcome. Nevertheless, the significance of the outcome remains because the program uses an analysis method that adjusts significance levels to account for small numbers of subjects in cells.

In any case, this result only heightens the significance of the integration factor, inasmuch as the comparison treatment does not appear to be generally superior.

Effect of Head Start

Another multivariate analysis of covariance was performed on the data for all students of the study to determine the effect of participation in the Head Start Program, using the same ten-score achievement vector as in previous analyses. In this analysis there were three crossed factors as follows:

Head Start: Two levels, according to whether or not the student participated in the Head Start Program.

Experimental Condition: Two levels, experimental and comparison.

Readiness: Two levels, according to total score on the MRT.

Below 40 - Lower Readiness

40 and above - Higher Readiness

The multivariate F tests associated with each of the main effects was significant with a probability of less than .03. As is the case of the analysis for Negro students just reported, it was not surprising that the readiness factor and the experimental conditions factor were significant. These factors were included in the analysis to determine

the significance of interaction effects with respect to the Head Start treatment. However, No interaction with respect to the Head Start treatment was significant at less than the .05 level of probability.

Two covariates were used, mental age and father's occupation. Father's occupation was included because it was known that the occupation of Head Start students' fathers would be of much lower status on the average than those of fathers of non-Head Start students. Table 13 shows cell means according to Head Start participation. It is difficult to account for the significance of the multivariate test of significance for this factor, because the effect of the covariate could be extreme. While the Head Start students have much lower mean scores for the two covariates, their other mean scores on the criterion measures are also much lower than for non-Head Start students. The program printout shows that actually the Head Start students' achievement scores are so much lower than those for non-Head Start students that even the effect of the covariates is not sufficient to equalize these scores. Actually, taking the covariates into consideration, Head Start students did achieve better than non-Head Start students on six of the criteria after covariate adjustment, but these six criteria were not the ones to which the significance of the effect of Head Start could be attributed. As seen in Table 13, this significance can probably largely be attributed to the variables, Reading and Arithmetic, on the first MAT administration and to Word Knowledge and Arithmetic on the second MAT administration. On three of these four variables, the non-Head Start group was favored.

This analysis differs considerably from most published analyses on Head Start students' achievement. In most cases, the achievement of Head Start students is compared to that of other students who were

Table 13 - Effect of Head Start on Achievement

Variable		Head Start N=91 Raw Mean	S.D.	Non-Head Start N=341 Raw Mean	S.D.	Univariate F Tests F(1,442)	p less than
Mental Age, months (covariate)		66.6	9.83	80.0	8.96	-	-
Father's occupation[1] (covariate)		2.73	.375	1.93	.631	-	-
Metropolitan Achievement First Administration:	Word Knowledge**	11.7	5.32	16.5	6.74	.282	.596
	Word Discrimination*	12.5	5.79	17.0	6.34	.380	.538
	Reading**	12.6	6.32	16.8	6.77	2.85	.092
	Arithmetic**	24.8	10.9	39.4	11.7	5.40	.021
Metropolitan Achievement Second Administration:	Word Knowledge*	20.3	6.12	24.3	6.58	2.09	.149
	Word Discrimination*	19.8	7.01	24.8	6.25	.342	.462
	Reading*	20.9	6.18	25.7	8.91	.630	.428
	Arithmetic**	40.3	10.8	49.3	10.7	1.98	.160
Hotel Instructional Level[2]*		1.68	.758	2.01	.799	.555	.457
Teacher Evaluation, grade placement*		1.42	.251	1.59	.137	.020	.887

[1]Coded as follows: 1=professional; 2=skilled; 3=unskilled
[2]Coded as follows: 1=preprimary; 2=primary; 3=1st grade;
4=2nd grade, 1st semester; 5=2nd grade, 2nd semester; etc.
*Magnitude of adjusted means was greater for Head Start condition than Non-Head Start condition
**Magnitude of adjusted means was greater for Non-Head Start condition than Head Start condition

eligible to participate in Head Start but who did not. In the above analysis, Head Start participants are compared with all students who did not attend Head Start, most of whom were not eligible. However, two covariates, mental age and father's occupation, were included to equalize for the depressing effect of the typical Head Start student's environment. The fact that these two covariates yielded results in favor of the non-Head Start student is quite meaningful. It shows that the effect of deprivation on students eligible for Head Start is more pervasive than what may be accounted for by measures of intelligence and socioeconomic status. This result supports statements by Deutsch (1960) and other investigators who have had difficulty establishing relationships between sources of deprivation and their effects.

Effect of Grouping on Achievement

A new multivariate analysis of covariance was performed on scores of all students in the study. In this analysis there were four crossed factors as follows:

Grouping: Two levels, homogeneous and heterogeneous.

Readiness: Two levels, according to total scores on the MRT.

Below 45 - Lower Readiness

45 and above - Higher Readiness

Experimental Condition: Two levels, experimental and comparison.

Sex: Two levels, male and female.

Mental age was used as a covariate, as in other analyses reported above, and the same ten achievement scores represented the criterion

vector for each student. The multivariate F test associated with each of the main effects was significant with a probability of less than .005. Again, the factors, experimental conditions, readiness and sex were expected to account for cell mean differences. It was the main effect, grouping, which was of particular interest in this analysis. Interaction of other factors with grouping were of interest but no satisfactory interpretation can be made regarding the associated F tests because cells associated with interaction represented groups of students taught in some cases by only two or three teachers. Since teacher selection may not have been genuinely random, it would be inadvisable to draw conclusions based on the small number of teachers. Insofar as the main effect of grouping is concerned, there were ten homogeneously grouped and ten heterogeneously grouped classrooms. Any bias associated with teacher selection has considerably more opportunity to "average itself out" than in the case in which only two or three teachers are involved. Even in this case, however, the conclusion must be considered only a tentative one subject to further investigation.

Table 14 shows cell means for homogeneously and heterogeneously grouped students and the associated univariate F tests. Since the covariate, mental age, is nearly equal on the average for the two groups, the significance of the multivariate F test is easy to interpret. It is clear that the heterogeneously grouped students had higher achievement.

Any interpretation of this result, in terms of the implications for the study, must take into account teacher differences. As pointed out by many investigators (Below, 1962, 1963) grouping per se does not

Table 14 - Effect of Grouping on Achievement

Variable		Homogeneous N=200 Raw Mean	S.D.	Heterogeneous N=243 Raw Mean*	S.D.	Univariate F Tests F(1,414)	p less than
Mental Age, months (covariate)		76.2	13.6	77.6	12.1	-	-
Metropolitan Achievement First Administration:	Word Knowledge	15.4	7.84	15.7	7.14	.009	.926
	Word Discrimination	15.1	7.50	17.0	6.99	7.10	.008
	Reading	14.8	6.18	17.1	7.85	8.00	.005
	Arithmetic	33.8	15.8	38.6	15.0	16.0	.001
Metropolitan Achievement Second Administration:	Word Knowledge	21.9	8.50	24.4	7.33	19.8	.001
	Word Discrimination	22.6	8.73	24.6	7.64	10.4	.001
	Reading	22.6	10.9	26.4	10.2	18.0	.001
	Arithmetic	46.3	12.6	48.1	13.4	1.85	.175
Total Instructional Level[1]		1.74	1.07	2.10	1.02	16.8	.001
Teacher Evaluation, grade placement		1.55	.309	1.56	.259	.457	.639

[1] Coded as follows: 1=preprimary; 2=primary; 3=1st grade;
4=2nd grade, 1st semester; 5=2nd grade, 2nd semester; etc.

*The magnitude of adjusted means for each variable was greater for heterogeneous grouping except for Teacher Evaluation and MAT Word Knowledge first administration.

insure an effect on achievement. The results just reviewed certainly offer no support for homogeneous grouping on the basis of MRT.

Section 3 - Subsidiary Results

The Validity of the Metropolitan Readiness Test

In the preceding section, it was stated that readiness, as measured by total score on the MRT, is a strong determiner of first grade achievement even when mental age is held constant. In view of this result, a further study of the relation of MRT scores to achievement was undertaken, particularly with respect to scores on subtests of the MRT. Results of other studies in this area concur with those of Mitchell (1967) who found, for the most part, no significant differences in predictive validity of MRT part or total scores with respect to race. In fact, for some criteria, she found total scores and part scores on the MRT to be more valid predictors for Negro students than for white. Reid and Beltramo (1966) present evidence which shows that level of readiness as determined by MRT scores may interact with instructional methods in some cases. This phenomenon was observed in the results reported in Section 2 to the extent that lower readiness students in the experimental group achieved better than did lower readiness students in the comparison group. In general, the MRT has been found to be reliable and valid with culturally disadvantaged, average and culturally advantaged populations (Robinson and Hanson, 1965). However, the use of more powerful statistical techniques, such as factor analysis, is not wide spread in validity studies involving the MRT.

For the present study, correlations between total scores on the MRT and scores on the second administration of the MAT Reading Subtest suggested the need for further analysis. For all students in the study,

the correlation between scores on total MRT and the second MAT Reading Subtest is .62. For white students only, this same correlation is .54, while for Negro students it is .68. No other grouping breakdown of the subjects, such as experimental-comparison or male-female, produced such a marked difference in the predictive validity of the MRT. This difference is particularly worth noting in view of the fact that for the Negro students there was some restriction of range on both sets of scores.

To investigate this phenomenon further, two factor analyses were performed on twenty-seven variables for the Negro and white students in the study on whom a second set of MRT scores was collected in May of the school year. For each set of data, Negro and white, unities were placed in the diagonals of the corresponding intercorrelation matrices and a principal components extraction was performed to the point at which eigenvalues of less than .8 were encountered. For each analysis, a varimax rotation was performed for all factors corresponding to eigenvalues greater than unity. The results of these rotations are shown in Tables 15 and 16 which also list the twenty-seven variables used in this phase of the study. Total scores for the MRT on either administration were not included because to do so would bias factor structure in favor of an "MRT factor" due to the high correlations of scores on each part of the MRT with total MRT scores.

Interpretation of the results of these factor analyses must be considered only tentative in view of the relatively small number of subjects involved and because of the possibility that selection was not genuinely random. Nevertheless, the results seem quite clear cut and certainly warrant further investigation in certain areas.

Table 15 - Varimax Rotation of Principal Components

Extraction from Achievement and Readiness Variables for Negro Students N=59

Variable		Factor Loadings 1	2	3	4	5	6
No. of siblings		-.071	-.003	-.066	.049	.849	-.120
Father's occupation		-.424	-.008	.069	.688	.106	-.119
Days absent		-.229	-.031	-.073	-.197	-.186	.815
Mental Age		.625	.154	.420	-.289	.004	-.020
Botel Potential Level		.865	-.007	.052	-.200	-.060	-.036
Botel Instructional Level		.862	-.027	.083	-.164	-.078	.032
Teacher Evaluation		.458	-.029	.757	-.061	-.137	-.130
Metropolitan Readiness First Administration:	Word Meaning	.046	.608	.128	-.055	-.132	-.193
	Listening	.136	.836	.122	.048	.170	-.043
	Matching	.543	.533	-.131	.348	-.028	-.072
	Alphabet	.766	.394	.056	-.111	.063	-.013
	Numbers	.610	.406	.218	-.101	.090	-.032
	Copying	.726	.060	.248	-.160	.132	.006
Metropolitan Readiness Second Administration:	Word Meaning	-.185	.616	.039	-.036	-.016	-.656
	Listening	.145	.836	.051	-.107	.091	-.000
	Matching	.394	.156	.301	-.540	.158	.025
	Alphabet	.196	.287	.735	-.024	.025	-.118
	Numbers	.386	.454	.587	-.170	.208	-.032
	Copying	.233	.410	.322	-.204	.510	.026
Metropolitan Achievement First Administration:	Word Knowledge	-.050	.463	.359	-.379	-.102	-.550
	Word Discrimination	.274	.289	.414	-.378	-.113	-.390
	Reading	-.031	-.053	.598	-.388	-.461	-.097
	Arithmetic	.709	.162	.439	-.281	.130	-.097
Metropolitan Achievement Second Administration	Word Knowledge	.739	.089	.531	.156	-.046	.005
	Word Discrimination	.636	.094	.565	-.057	.046	-.160
	Reading	.808	.093	.318	-.013	-.027	-.117
	Arithmetic	.574	.045	.649	.090	.289	.085
Percent of variance accounted for		26.287	13.400	14.785	6.558	5.740	6.388

Table 16 - Varimax Rotation of Principal Components

Extraction from Achievement and Readiness Variables for White Students N=80

Variable		Factor Loadings 1	2	3	4	5	6
No. of siblings		-.005	-.087	.254	-.322	.638	-.211
Father's occupation		-.022	-.642	.317	-.018	.022	-.137
Days absent		-.260	.004	-.074	.148	.648	.081
Mental Age		.375	.699	.113	.241	-.121	.239
Hotel Potential Level		.417	.648	-.154	.212	-.215	.088
Hotel Instructional Level		.617	.164	.165	.140	.030	.561
Teacher Evaluation		.616	.245	.105	.182	-.149	.584
Metropolitan Readiness First Administration:	Word Meaning	-.039	.516	.134	.527	.169	-.016
	Listening	.274	.159	.176	.739	.162	-.031
	Matching	.134	-.066	-.122	.762	-.263	.105
	Alphabet	.355	.222	-.309	.612	-.194	.242
	Numbers	.386	.230	-.035	.738	-.051	.262
	Copying	.152	.182	.051	.429	-.234	.494
Metropolitan Readiness Second Administration:	Word Meaning	.235	.795	.083	.083	-.099	.077
	Listening	.210	.488	.480	.244	-.027	-.147
	Matching	.252	.181	.109	.148	-.612	.221
	Alphabet	.691	-.166	.123	-.046	-.309	-.142
	Numbers	.388	.127	.567	.013	-.383	-.036
	Copying	-.111	-.169	.847	-.091	.074	.110
Metropolitan Achievement First Administration:	Word Knowledge	.741	.358	-.126	.219	-.120	.288
	Word Discrimination	.739	.280	-.147	.160	-.010	.293
	Reading	.166	.048	-.071	.055	-.070	.833
	Arithmetic	.712	.335	.052	.281	-.238	.137
Metropolitan Achievement Second Administration:	Word Knowledge	.862	.154	.029	.171	-.182	.145
	Word Discrimination	.866	.110	-.106	.231	-.127	.083
	Reading	.710	.175	.161	.274	.061	.365
	Arithmetic	.734	.258	.195	.165	-.319	.024
Percent of variance accounted for		24.092	12.109	6.790	11.963	7.387	8.619

Factor Analysis Results for Negro Students

In Table 15 for Negro students, Factor 1 is clearly associated with general academic achievement as evidenced by loadings greater than .5 on six of the ten achievement variables. Note also that four of the six subtests of the first administration of the MRT also have loadings greater than .5 on this same factor. Mental age and the potential level on the BRI also load substantially on this factor. The subtests of the second administration of the MRT do not load strongly on Factor 1 and this result is plausible when it is considered that most normal first graders should be thoroughly versed in the kinds of responses required on the MRT by May of the school year.

There seems to be no reason to question the validity of the MRT for Negro students. It is true that the MRT Word Meaning Subtest and the Listening Subtest did not load to any substantial extent on the achievement factor, but if total MRT scores are used for prediction, the test would appear to be quite valid. Factor 2 (Table 15) appears to be an "MRT factor." Almost all parts of the MRT in both administrations loaded somewhat on this factor. This result is probably due to substantial intercorrelation between scores on the various parts of the MRT. Factor 3 seems to be another factor associated with achievement. Six of the ten achievement variables have loadings on this factor greater than .4, but none of the parts of the first administration of the MRT load on this factor to any substantial extent. The Alphabet and Numbers Subtests of the second administration of the MRT do load substantially on Factor 3, but there is no suggestion that readiness is, in general, associated with achievement as represented by this factor. Thus, it appears that for the Negro students of the study, readiness as measured by the MRT affects only certain phases of achievement.

Factors 4,5, and 6 for the Negro students appear to be associated respectively with father's occupation, number of siblings and attendance. Achievement variables load on these factors in some cases, but there is no readily interpretable pattern and the percent of variance accounted for by any one of these factors is very small.

Factor Analysis for White Students

Table 16 shows the results of a factor analysis for white students corresponding to the one just presented for Negro students. While the same variables are represented and analyzed by the same procedures, the results are quite different. For the white students, Factor 1 is associated with achievement, as was the case for the Negro students. Eight of the ten achievement variables have loadings greater than .6 on this factor but no variable from the first administration of the MRT has a loading on Factor 1 as great as .4. Further, in this analysis there is no other factor which can plausibly be related to achievement. Therefore, this analysis does not permit a favorable interpretation with respect to the validity of the MRT for white students. Factor 2 (Table 16) appears to be associated with intelligence and extensiveness of vocabulary as evidenced by high loadings on the variables, mental age, potential level of the BRI and Word Meaning on both administrations of the MRT. It is interesting to note that father's occupation also loads quite heavily on this factor. Factor 3 seems to be associated primarily with three subtests from the second administration of the MRT, while Factor 4 has substantial loading on all six subtests of the first administration of the MRT. These two results taken together suggest that for white students the subtests of the MRT are more highly correlated with each other than with achievement variables. Factor 5 seems to be associated

with the variable, number of siblings, and it is interesting to note that the Matching subtest of the second administration of the MRT and number of days absent also load strongly on this factor. However, in view of the small amount of variance accounted for by this factor, no specific interpretation is suggested. Factor 6 seems to be associated with early success in reading as evidenced by the high loading on the first administration of the MAT Reading Subtest. The Copying Subtest of the first administration of the MRT does have a loading of .49 on this factor, but this phenomenon is not sufficiently pronounced to warrant interpretation in view of the small amount of variance accounted for by this factor.

Implications for Use of the Metropolitan Readiness Test

Inspection of the items of the MRT shows that a large number of them reflect the influence of middle-class white culture. For example, in the Numbers Subtest a child is asked to tell which costs more, the choices being pictures of a bicycle, a motor cycle, an automobile and a tricycle. In the same subtest he is asked to tell which of four watches shows 9 o'clock. In the Word Meaning Subtest he is asked to distinguish between a strawberry, a blackberry and a blueberry. The authors of this report do not question the validity of these items. They may contribute strongly to the validity of the MRT for predicting successful achievement with respect to the typical first grade curriculum. This phenomenon may be particularly effective in the case of Negroes, because those Negroes who have the kind of background which results in high MRT scores may also be particularly well equipped to cope with the typical first grade curriculum. White children, on the other hand, may be so uniformly acculturated that

knowledge necessary to attain higher scores on the MRT may not be so strongly related to achievement potential.

This interpretation of the factor analyses presented above will require further investigation prior to general application of the results. Nevertheless, the outcomes to this point may provide valuable insights for those connected with the Gulfport Project.

Year-End Behavior Associated with Successful Reading Achievement

As outlined in Section 1, the protocol, Evaluation of Cognitive Development--Pre-Reading Skills (Goolsby, 1969),was administered to subsets of both the experimental and comparison groups. For each of 134 students, teachers stated whether each of the 64 behaviors related to reading was present. This instrument was designed as a "readiness" measure, but was not available until the end of the school year. Its use at that time was strictly for experimental purposes. It was expected that many of the behaviors listed would be exhibited by all or nearly all of the students completing first grade. Of the 64 behaviors listed, more than half were exhibited by all or nearly all students, in both the experimental and comparison groups. The variables representing those behaviors not attained by all or nearly all of the students were then combined with the following readiness and achievement variables in a factor analysis: Word Meaning, Listening, Matching, Alphabet, and Copying Subtests of the MRT; Mental Age (Otis-Lennon); Botel Potential Level; Botel Instructional Level; Teacher Evaluation; and the Word Knowledge, Word Discrimination, and Reading Subtests of the first and second administrations of the MAT.

Unities were placed in the diagonals of the matrix of intercorrelations between the 15 readiness and achievement variables and the 32 variables representing behavior not attained by all or nearly all students. A principal component extraction followed, which was terminated when eigenvalues of less than unity were encountered. A varimax rotation was then performed on all factors with eigenvalues greater than 1.5.

The results of this analysis are not shown in tabular form because of their length and because a few words serve to present the essential outcome. All achievement and readiness variables loaded on a single factor. On this same factor, 11 of the behavior variables also had loadings greater than .4. Loadings on 21 other behavior variables were spread over 8 additional factors. Each accounting for only a small proportion of variance.

It is with regard to the 11 behavior variables loading on the achievement-readiness factor that interpretation can be made with respect to this factor analysis. Whatever the relationship of the other 21 variables may be with respect to each other, there is certainly no evidence to suggest that they are strongly related to achievement or readiness. Considerable potential importance may be drawn with regard to the 11 behavior variables which were strongly associated with achievement and readiness. These variables are:

Following simple directions in a group setting.

Following multiple directions in a group setting.

Composing an original story.

Recognizing written name of others.

Writing names of others.

Spelling orally names of others.

Distinguishing words according to initial letters.

Distinguishing words according to letter order.

Discriminating beginning letter sounds.

Discriminating ending letter sounds.

Bringing library or other books to read (himself).

This list of behaviors separates itself naturally into two categories: First, behavior relating to interaction with other children and, second, behavior relating to phonic discrimination. It is strongly suggested by this outcome that teachers and investigators of learning processes in children of this age concentrate upon the implied relationship between these two categories of variables and reading achievement.

The results just reported hold for the major groups which have been distinguished thus far in the course of the study. Separate factor analyses were performed on males and females, experimental and comparison students, Negroes and whites, and on high and low readiness students. In some cases, the observed relationships were weakened slightly due to restriction in range of the variables, but in every case the same basic pattern emerged. Certain social behaviors and behaviors reflecting phonics ability were clearly related to reading readiness and achievement.

Section 4 - Implications and Recommendations

While the research reported herein was funded for only one year, it may be that various phases of such a program may be retained in the Gulfport Municipal Separate School System or evaluated in other settings. Therefore, this section is presented in terms of evaluations and recommendations for an ongoing program to ameliorate instructional deficiencies.

The Effect of Intervention

From the results presented in Section 2, it is clear that improvement of conditions had a strong effect on achievement. In spite of mental ages averaging six months lower than those for the comparison group, the experimental group essentially matched their achievement by the end of the school year. However, this effect was not uniform over all groups in the population definable in terms of educationally meaningful variables. Consequently, treatment effect interactions with other variables must be carefully taken into consideration both in evaluating outcomes and in planning further treatment.

The special instructional materials used were largely designed to enhance readiness, but the teachers involved reported that, for high readiness students (according to total MRT scores), these materials were inappropriate. This judgment may account for the observed interaction between readiness and experimental condition. Lower readiness children showed considerably more progress under the experimental condition considering their mental ages than did high readiness students. This interaction was highly significant statistically and of substantial effect in terms of observed cell mean differences.

In view of the preceding, it is strongly recommended that supplementary materials be extended by areas in kind and quality, especially materials planned for high readiness students. In introducing these new materials, other conditions might be adjusted to a moderate degree to attempt to maintain the global effect of intervention while reducing the extent of the measures taken. For example, class size might be raised to 30 while maintaining the teacher aides and special materials.

Readiness

Readiness as measured by total scores on the MRT proved an important determiner of achievement in both experimental and comparison classes even when mental age was held constant. Nevertheless, there was certain evidence suggesting lower MRT validity for white students than for Negro. These results may reflect a readiness factor associated with acculturation. Such a factor would be important to the extend that school achievement depends on cultural orientation.

To investigate this phenomenon further, it is recommended that a second readiness measure be adopted for use with the MRT. Such an instrument should have relatively few items directly associated (by inspection) with the cultural orientation of the students.

Achievement Variables

Measurement of achievement in language arts and arithmetic using the MAT resulted in scores with satisfactory statistical characteristics for the most part. Therefore, it is recommended that this battery be retained for evaluation purposes.

The BRI also produced scores with good statistical characteristics. Further, teachers found the BRI very helpful for diagnostic purposes and for interim evaluation of progress. Therefore, it is recommended that the BRI be retained for evaluation of progress and potential.

The variable, teacher evaluation, did not correlate strongly with other achievement measures, perhaps for reasons discussed in Section 2. Therefore, discontinuation of its use is recommended unless investigators are willing to undertake a substantial program to orient teachers to levels of achievement throughout the school system.

Personal Variables

A continuation of the collection of all personal data reported in the study is recommended. These data were helpful both in statistical tests of significance and in interpreting various outcomes.

Perhaps the most helpful and powerful variable in this respect was father's occupation. Results of use of the instrument developed by the authors to classify students according to occupation was highly successful and yielded interpretations of results which would otherwise not have been possible.

Head Start

The rather inconclusive result regarding the effect of Head Start participation as reported in Section 2 shows the need for further investigation. It is recommended that additional data be collected bearing on causes of deprivation. Variables to be considered might include family income, quality of residence, education of parents, etc.

Grouping

There is no suggestion from results reported earlier that grouping was helpful to achievement in the framework of the Gulfport Project. Therefore, it is recommended that in further investigations of this type, readiness grouping not be done in the first grade.

This proposal leaves open the question of the effects of achievement level grouping in higher grades. Should the Project be extended to higher grades, such grouping might well be tried.

Relationships Between Behaviors and Achievement

The results in Section 3 relating certain behaviors with successful achievement certainly merit further investigation. Six behaviors were related to social interaction, for example, following group instructions and writing or spelling names of others. In this connection, it is recommended that instructional activities and units be developed around the theme of interpersonal relationships. The inventory, Evaluation of Cognitive Development--Pre-Reading Skills (Goolsby, 1969), should be administered early in the year and again at the end to monitor the presence of the behaviors in question.

Behaviors related to phonic discrimination were also significantly related to achievement. However, no additional investigation is recommended in this connection due to the presence of a well developed program to teach phonics in the Gulfport Municipal Separate School District.

Additional Measures

While it would be desirable to collect data on certain sociocultural and personality variables, it is not recommended at this time since the school personnel involved in the study expressed considerable concern about the amount of time and effort needed to collect the data reported herein.

It is recommended that measures of small unit work (formative evaluation) be taken when good tests of its outcome are available.

Appendix I

Part A

Materials Used with Experimental Groups

A beginning geography unit: Earth: Man's home. Imperatore, W. Research and Development Center in Educational Stimulation, University of Georgia, Athens, Georgia, (Publication No. 1BC), 1968.

Concept of culture. Hunt, A., Blackwood, J., & Emmons, F. Research and Development Center in Educational Stimulation, University of Georgia, Athens, Georgia, (Publication No. 51a), 1968.

Language arts and verbal learning program: Part I: Introductory exercises in oral language. Jennings, B. L., Walter, P., Duhling, D., & Quirk, K. Research and Development Center in Educational Stimulation, University of Georgia, Athens, Georgia, August, 1968.

Language arts and verbal learning program: Part II: Introductory exercises in reading. Aaron, R. L., and Mason, G. E. Research and Development Center in Educational Stimulation, University of Georgia, Athens, Georgia, August, 1968.

Language arts and verbal learning program: Part III: Introductory exercises in writing. Aaron, R. L., and Mason, G. E. Research and Development Center in Educational Stimulation, University of Georgia, Athens, Georgia, August, 1968.

Mathematics program: Suggested mathematics activities for five-year-olds. Perrodin, A. F. Research and Development Center in Educational Stimulation, University of Georgia, Athens, Georgia, July, 1968.

Music program: Developing basic concepts of music. Williford, B., and Simons, G. M. Research and Development Center in Educational Stimulation, University of Georgia, Athens, Georgia, November, 1968.

Pre-primary science program, level 1. Zeitler, W. R. Research and Development Center in Educational Stimulation, University of Georgia, Athens, Georgia, September, 1968.

Physical education program: Movement exploration. Gober, B., and Albertson, L. Research and Development Center in Educational Stimulation, University of Georgia, Athens, Georgia, September, 1968.

Social science program: Getting acquainted. Hunt, A. Research and Development Center in Educational Stimulation, University of Georgia, Athens, Georgia, August, 1968.

The Ginn basic readers. Russell, D. H., and others. Boston: Ginn and Company, 1964.

Part B

Materials Used with Comparison Group

Imaginary Line Handwriting.
: Steck-Vaughn

Sets and Numbers. Gundlach, B. H., Welch, R. C., and Buffie, E. G. Atlanta: Laidlaw Brothers, 1965.

The Allyn and Bacon Basic Readers. Sheldon, William D. and Others. Atlanta: Allyn and Bacon, 1962.

The Ginn basic readers. Pratt, Marjorie and Others. Atlanta: L. W. Singer Company, 1965.

This is music. Sur, William R., and Others. Atlanta: Allyn and Bacon, 1967.

The L. W. Singer basic readers. Pratt, Marjorie and Others. Atlanta: L. W. Singer Company, 1965.

The Scott Foresman basic readers. William S. Gray and Others, Atlanta: Scott, Foresman and Company, 1965.

The Laidlaw basic readers. Shane, and Hester, K. B. Atlanta: Laidlaw Brothers, 1964.

Today's Basic Science

We Live with Others. Hunnicutt, C. W. and Grambs, J. D. Chicago: The L. W. Singer Company, 1963.

Appendix II

CLASSIFICATION OF STUDENTS ACCORDING TO FATHER'S OCCUPATION (OCCUPATION OF MOTHER OR GUARDIAN IF FATHER IS ABSENT)

The following guidelines are present with the realization that in some cases the teacher may have to make a judgment without full command of the facts regarding the occupational status of a parent or guardian. In such cases, no additional investigation should be made. Rather the teacher should classify the student according to her perception of the student's family background based on observation throughout the year. Because an occasional rating may therefore be inaccurate, it is essential that the finished rating sheet be shown only to personnel directly involved in processing the research findings. Of course, all responses will be held in strictest confidence and will be used only for group evaluation.

Classification 1 - The student's father (or guardian if the father is absent) holds a professional or managerial position. Such jobs usually but not always require at least a bachelor's degree. Examples are:

Accountants (senior or CPA)
Clergymen
Commissioned officers
County agents
Engineers or scientists
Lawyers
Medical doctors
Nurses (registered)
Proprietors or managers of substantial businesses or farms
Teachers

If in doubt as to whether a person belongs in this classification, the holding of a bachelor's degree is the best criterion on which to base the decision if this fact is known. If not, try to judge the level of association in the community. For example, a life insurance salesman who sells mainly large policies to the financially affluent segment of the community probably belongs in this classification. One who sells mainly small policies (perhaps on a weekly collection basis) would not.

Classification 2 - The student's father (or guardian) holds a regular, full-time job which requires training, knowledge and skill but not at the college level. Examples are:

Agricultural specialists (not college trained)
Automobile mechanics or other skilled tradesmen
Bookkeepers
Clerical and related workers
Draftsmen
Police officers
Postmen

Practical nurses or other non-professional health therapists
Sales personnel in retail stores (if training and knowledge are required, but not lower level sales clerks)
Service personnel (barbers, beauticians, bartenders, cooks, but not lower level waiter or waitress positions)
Supervisory personnel for lower level workers (foremen, etc.)

Classification 3 - The student's father (or guardian) holds a job (or jobs) which require only casual or short-term training. These jobs are usually of low prestige and relatively low paying. Examples are:

Agricultural workers (field hands, etc.)
Domestic workers (household servants)
Laborers (construction, etc.)
Laundry workers
Service and sales personnel in lower positions

If in doubt as to whether a job belongs in this category, the primary criteria are lack of any requirement for prior training, a short training period and little raise in pay following training.

Please mark the classification for each child in your class on the attached list.

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A Title III ESEA Project

Thomas M. Goolsby, Jr.
Robert B. Frary

July, 1969

UNIVERSITY OF GEORGIA ATHENS, GEORGIA